CLAIMS:

Sub-D1> 1. A semiconductor processor comprising:

a process chamber configured to receive a semiconductor workpiece for processing;

a supply connection in fluid communication with the process chamber and configured to supply slurry to the process chamber; and

a sensor configured to monitor the turbidity of the slurry.

2. The semiconductor processor according to claim 1 wherein the supply connection is arranged in a substantially horizontal orientation.

3. The semiconductor processor according to claim 1 wherein the supply connection is arranged in a substantially vertical orientation.

4. The semiconductor processor according to claim 1 wherein the sensor is configured to attach to the supply connection and detach from the supply connection without disruption of the supply of slurry within the supply connection.

5. The semiconductor processor according to claim 1 wherein the sensor is configured to emit electromagnetic energy towards the supply connection and to receive at least some of the electromagnetic energy from the supply connection.

6. The semiconductor processor according to claim 5 wherein the sensor is configured to receive reflected electromagnetic energy from the supply connection.

7. The semiconductor processor according to claim 1 wherein the sensor is configured to generate a signal indicative of the turbidity of the slurry responsive to the received electromagnetic energy.

8. The semiconductor processor according to claim 1 wherein the sensor is substantially insulated from the slurry.

9. The semiconductor processor according to claim 1 wherein the process chamber comprises a chemical-mechanical polishing chamber.

10. A sensor comprising:

a source configured to emit electromagnetic energy towards a subject material;

an initial receiver configured to receive at least some of the electromagnetic energy, the initial receiver being configured to generate a signal indicative of the turbidity of the subject material and responsive to the received electromagnetic energy; and

a housing configured to align the source and initial receiver with respect to the subject material.

11. The sensor according to claim 10 wherein the source comprises a light emitting diode.

12. The sensor according to claim 11 wherein the light emitting diode is configured to emit infrared electromagnetic energy.

13. The sensor according to claim 10 further comprising:

another receiver configured to receive at least some of the electromagnetic energy passing through the subject material and to generate a signal indicative of the received electromagnetic energy; and

a driver configured to control the amount of emitted electromagnetic energy from the source to provide a substantially constant amount of received electromagnetic energy at the another receiver.

14. The sensor according to claim 10 wherein the initial receiver is configured to receive emitted electromagnetic energy emitted without passage of the electromagnetic energy through the subject material.

15. The sensor according to claim 14 further comprising a beam splitter configured to direct electromagnetic energy from the source to the subject material and to the initial receiver.

16. The sensor according to claim 10 wherein the initial receiver is configured to receive emitted electromagnetic energy passed through the subject material.

17. The sensor according to claim 10 wherein the sensor is configured to receive reflected electromagnetic energy from the subject material.

18. The sensor according to claim 10 wherein the housing is configured to attach to a supply connection containing the subject material and detach from the supply connection without disruption of the flow of subject material within the supply connection.

19. An apparatus comprising:

a container configured to provide a subject material in a substantially static state; and

at least one sensor provided at a predefined position relative to the container to monitor the turbidity of the subject material at a desired vertical position of the container.

20. The apparatus according to claim 19 wherein the at least one sensor comprises a plurality of sensors provided at different predefined positions relative to the container to monitor the turbidity of the subject material at a plurality of desired vertical positions of the container.

21. The apparatus according to claim 19 wherein the at least one sensor comprises:

a source configured to emit electromagnetic energy towards the container; and

a receiver configured to receive at least some of the electromagnetic energy.

22. A semiconductor processor comprising:

a process chamber configured to receive and process a semiconductor workpiece;

a connection provided in fluid communication with the process chamber and configured to supply slurry to the process chamber; and

a sensor configured to monitor the turbidity of the slurry and including:

a source configured to emit electromagnetic energy towards the connection; and

a receiver configured to receive at least some of the electromagnetic energy.

23. The semiconductor processor according to claim 22 wherein the connection is arranged in a substantially horizontal orientation.

24. The semiconductor processor according to claim 22 wherein the connection is arranged in a substantially vertical orientation.

25. The semiconductor processor according to claim 22 wherein the sensor is configured to generate a signal indicative of the turbidity responsive to the received electromagnetic energy.

26. The semiconductor processor according to claim 22 wherein the sensor is substantially insulated from the slurry.

27. The semiconductor processor according to claim 22 further comprising a housing coupled with the connection and configured to align the source and the receiver with respect to the connection.

28. The semiconductor processor according to claim 22 wherein the process chamber comprises a chemical-mechanical polishing chamber.

29. The semiconductor processor according to claim 22 wherein the connection is transparent.

30. The semiconductor processor according to claim 22 wherein the connection is translucent.

31. A semiconductor processor system comprising:

a distributor configured to supply a slurry;

a process chamber configured to receive and process a semiconductor workpiece;

a connection configured to supply slurry from the distributor to the process chamber; and

a sensor configured to monitor the turbidity of the slurry and including:

a source configured to emit electromagnetic energy towards the connection; and

a receiver configured to receive at least some of the electromagnetic energy.

32. The semiconductor processor system according to claim 31 wherein the sensor is substantially insulated from the slurry.

33. The semiconductor processor system according to claim 31 wherein the process chamber comprises a chemical-mechanical polishing chamber.

34. The semiconductor processor system according to claim 31 wherein the connection is transparent.

35. The semiconductor processor system according to claim 31 wherein the connection is translucent.

36. A semiconductor workpiece processing method comprising:
providing a semiconductor process chamber;
supplying slurry to the semiconductor process chamber; and
monitoring the turbidity of the slurry using a sensor.

37. The method according to claim 36 wherein the supplying comprises using a supply connection and the monitoring comprises monitoring slurry within the supply connection.

38. The method according to claim 37 further comprising coupling the sensor with the supply connection.

39. The method according to claim 36 wherein the monitoring comprises:
emitting electromagnetic energy towards the slurry; and
receiving at least some of the electromagnetic energy.

40. The method according to claim 36 further comprising generating a signal indicative of the turbidity after the monitoring.

41. The method according to claim 36 further comprising insulating the slurry from the sensor.

42. The method according to claim 36 wherein the providing comprises providing a chemical-mechanical polishing process chamber.

43. A turbidity monitoring method comprising:

providing a source;

emitting electromagnetic energy towards subject material using the source;

aligning an initial receiver relative to the subject material;

receiving at least some of the electromagnetic energy after the emitting using the initial receiver; and

generating a signal indicative of the turbidity after the receiving.

44. The method according to claim 43 wherein the emitting comprises emitting infrared electromagnetic energy.

45. The method according to claim 43 further comprising:

second receiving at least some of the electromagnetic energy passing through the subject material using another receiver; and

controlling the emitting responsive the second receiving to provide a substantially constant amount of received electromagnetic energy at the another receiver.

46. The method according to claim 45 further comprising directing the emitted electromagnetic energy to the initial receiver and the another receiver.

47. The method according to claim 43 wherein the receiving comprises receiving electromagnetic energy not passing through the subject material.

48. The method according to claim 43 wherein the receiving comprises receiving electromagnetic energy passing through the subject material.

49. A turbidity monitoring method comprising:

providing a container;

providing subject material in a substantially static condition within the container;

monitoring the turbidity of the subject material at a predefined vertical position within the container; and

generating a signal indicative of the turbidity of the subject material after the monitoring.

50. The method according to claim 49 further comprising monitoring the turbidity of the subject material at another predefined vertical position within the container.

51. The method according to claim 49 wherein the monitoring comprises:

emitting electromagnetic energy towards the subject material; and

receiving at least some of the electromagnetic energy.

52. The method according to claim 49 further comprising rotating the subject material during the monitoring.

53. A semiconductor workpiece processing method comprising:

providing a semiconductor processor having a process chamber configured to receive a semiconductor workpiece;

supplying slurry to the process chamber using a connection;

emitting electromagnetic energy towards the connection using a sensor;

receiving at least some of the electromagnetic energy using the sensor; and

generating a signal indicative of turbidity of the slurry responsive to the receiving.

54. The method according to claim 53 wherein the emitting comprises emitting infrared electromagnetic energy.

55. The method according to claim 53 further comprising substantially insulating the slurry from the sensor.

56. The method according to claim 53 wherein the providing comprises providing chemical-mechanical polishing semiconductor processor.

57. The method according to claim 53 further comprising attaching the sensor to the connection and detaching the sensor from the connection while maintaining the supplying.

58. A semiconductor workpiece processing method comprising:

providing a semiconductor processor having a process chamber configured to receive a semiconductor workpiece;

supplying slurry to the process chamber using a connection;

emitting infrared electromagnetic energy using a source;

splitting the infrared electromagnetic energy to direct some of the infrared electromagnetic energy towards the connection;

first receiving at least some of the infrared electromagnetic energy passing through the connection using a first receiver;

generating a feedback signal using the first receiver responsive to the first receiving;

adjusting the emitting via the source responsive to the feedback signal to provide a substantially constant amount of electromagnetic energy to the first receiver;

second receiving at least some of the infrared electromagnetic energy not passing through the connection using a second receiver; and

generating a signal indicative of turbidity of the slurry using the second receiver responsive to the second receiving.

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